

# SHOULD THE FCC DEPART FROM MORE THAN A DECADE OF MARKET-ORIENTED SPECTRUM POLICY? REPLY TO SKRZYPACZ AND WILSON

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*In this report, we reply to the comments of Andrzej Skrzypacz and Robert Wilson on behalf of Frontline Wireless in the Federal Communications Commission's 700 MHz Auction proceeding. Frontline's economists primarily advocate two restrictions on the auction that would significantly limit the number of bidders for the E Block license, one of several blocks for sale in the auction. One restriction would exclude all incumbent wireless operators and cable operators from participating in the E Block auction. A second restriction would require that the winning bidder employ a wholesale-only business model.*

*We examine the likely costs and benefits of these two restrictions in some detail. We argue that the benefits of these restrictions would likely fall short of the costs, so they should not be adopted. In performing our cost-benefit analysis, we point out that Skrzypacz and Wilson failed to consider the unintended consequences of recent efforts to restrict entry in U.S. wireless auctions (the NextWave story) and to impose mandatory open access obligations on U.S. wireline operators (the CLEC story).*

*To justify their first restriction, Frontline's economists assert that the only motivation for the incumbents' participation in the E Block would be to foreclose other wireless entrants. We explain that there are procompetitive reasons for the incumbent carriers to participate in the E Block auction. We also explain that Frontline's economists have failed to demonstrate that incumbent carriers have both the ability and incentive to warehouse spectrum.*

*To justify their second restriction, Frontline's economists assert that the wireless industry's market structure is inefficient due to "vertical integration" of incumbent carriers across wholesale and retail functions. According to Skrzypacz and Wilson, Frontline's proposed wholesale-only restriction would permit the wireless industry to evolve into an allegedly more efficient state of structural separation, as incumbent carriers would be forced to embrace a wholesale business model. We demonstrate that the authors fail to present a compelling case as to why their proposed business model would likely result in benefits in excess of costs.*

*We explain that the proposed restrictions on the auction would likely insulate firms, such as Frontline, from competition in the auction. Such insulation may result in a windfall for Frontline, but it is unlikely to be in the best interests of the American consumer. The FCC should send a clear signal to industry participants that it rejects any form of rent-seeking behavior by rejecting Frontline's proposal.*

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## I. INTRODUCTION

Since embracing auctions in the early 1990s, the Federal Communications Commission (FCC) has consistently embraced a market-oriented spectrum policy that sought to maximize participation in spectrum auctions and allowed winning bidders to develop business models of their own choosing. The result has been nothing short of spectacular: wireless competition has thrived, as multiple carriers with differentiated products compete aggressively for customers. Average per-minute prices have declined from \$0.44 to \$0.07 in one decade, and innovation is exploding, with new handsets and applications being introduced at dizzying speeds. Like any innovative process unleashed by market forces, some business models have thrived while others have not. The point of the great experiment was to allow market participants (wireless carriers and wireless consumers), not regulators, to make the critical choices relating to prices, services, and quality.

Frontline and its expert economists, Drs. Andrzej Skrzypacz and Robert Wilson of Stanford University, are seeking to upend that tradition. Because consumers prefer to interface with a single vendor to obtain their wireless services, and because there are economies of scope in operating a network (the wholesale function) and selling service to consumers (the retail function), the wireless carriers have not broadly embraced the wholesale-only business model that Frontline and its economists are advocating. Indeed, Frontline's economists argue that the market will *never* produce such a model: "These [alternative] companies bring innovative ideas and technologies, but the nationwide operators have no incentive to offer a competitive wholesale service."<sup>1</sup> Skrzypacz and Wilson argue, without any empirical support, that a wholesale-only business model would be more efficient than the current market design, which they describe as one of "vertical integration."<sup>2</sup> According to

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1. Andzeg Skrzypacz & Robert Wilson, The Design of the 700 MHz Spectrum Auction: An Opportunity to Promote Competition and Public Safety, *in re*: Service Rules for the 698-746, 747-762, and 777-792 MHz Bands, WT Dkt. No 06-150, prepared for Frontline Wireless, May 23, 2007, at 11 [hereinafter Skrzypacz & Wilson]. It should be noted that in fact, several of the nationwide carriers employ both a wholesale and a retail business model. Specifically, Sprint/Nextel sells capacity at wholesale rates to several resellers, including Virgin Mobile and Disney Mobile. See Charlie Anderson, *Mobile ESPN among Sprint Nextel wholesale subscribers seeing drop*, Kansas City Business Journal, Aug. 3, 2006, available at [http://www.bizjournals.com/losangeles/stories/2006/07/31/daily64.html?from\\_rss=1](http://www.bizjournals.com/losangeles/stories/2006/07/31/daily64.html?from_rss=1). T-Mobile sells capacity on its network to a Hispanic-oriented Mobile Virtual Network Operator (MVNO) called TúYo Mobile. For a list of U.S. MVNOs and their wholesale providers, see List of United States mobile phone companies, available at [http://en.wikipedia.org/wiki/List\\_of\\_United\\_States\\_mobile\\_phone\\_companies](http://en.wikipedia.org/wiki/List_of_United_States_mobile_phone_companies). According to the FCC's own data, as of June 30, 2006, seven percent of wireless customers were served by resellers who acquired their underlying wireless service from licensees. See FCC, Local Telephone Competition: Status as of June 30, 2006, released January 31, 2007, at Table 14, available at <http://www.fcc.gov/wcb/iatd/comp.html>. Moreover, Commnet Wireless provides wholesale wireless voice and data services in rural markets in the Western and Midwestern United States. See <http://www.commnnetwireless.com>.

2. *Id.* We reject the notion that a network operator who provides wireless service is vertically integrated across two stand-alone product markets, as Skrzypacz and Wilson assert. See *id.* at 15 ("In the current market, the main two components are a *national connectivity service* and the provision of retail services to particular consumers. That is, a customer using a wireless device

Frontline's economists, government interference is needed to correct this alleged market failure. In particular, if the FCC could be persuaded to force the winning bidder of the E Block<sup>3</sup> in the 700 MHz auction to use a wholesale-only model,<sup>4</sup> then the wireless market would embrace the allegedly more efficient design: "One expects that after there are enough [retail] companies competing for final consumers, competition among them will lead the vertically integrated firms to open their networks to third-party retail operators as a source of additional revenue."<sup>5</sup> Thus, it appears that Frontline's ultimate policy agenda is an open access regime for *all* wireless carriers, not just the winner of the E Block in the 700 MHz auction. Recognizing that any attempt to impose mandatory unbundling for all wireless carriers would likely be rejected due to the competitive wireless market structure—the *largest* wireless operator (AT&T) controls only 27 percent of all wireless subscriptions nationwide—Frontline appears to be seeking to inject a small dose of mandatory open access through the back door.<sup>6</sup>

To achieve mandatory open access for all wireless carriers, it is not sufficient to merely impose a business model on the winning bidder of the E Block. In addition to a wholesale-only requirement, Frontline's economists seek to prevent incumbent wireless operators and cable operators from bidding in the auction. The most likely reason for Frontline to advocate such a rule is to insulate Frontline from competition for the license. In the wake of the NextWave affair, Frontline and its financiers likely detect an arbitrage opportunity that depends on the FCC's encumbering the E Block spectrum with costly obligations. In particular, Frontline could acquire the encumbered spectrum at a significant discount and then sell the (hopefully unencumbered) spectrum back to

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first connects to an available wireless network and then receives retail service via that network. Economists recognize that it is important to think about the components of the product separately in order to inform competition policy.") (emphasis in original). This is akin to arguing that a movie theater is comprised of two product markets: (1) the physical infrastructure that houses the screens and seats and (2) the ticket book that interfaces with customers.

3. We note that the FCC has not formally designated a specific license for an "E Block" of spectrum to be auctioned in the upcoming 700 MHz auction. At the time of this writing, we understand that the FCC still has the matter under review. However, Frontline and their economists premise their proposals and related analysis on the assumption that an E block license will be designated. Therefore, for purposes of this report, we use the term "E Block" license to mean the spectrum on which Frontline and its economists are focused.

4. Frontline does not advocate imposing the wholesale-only restriction on the other two blocks of spectrum for sale, the "C Block" and the "D Block."

5. *Id.* at 11-12. Although this idea sounds novel, years ago, several wireless carriers determined that they could realize additional revenues by opening their networks to third-party retail operators and have done so. *See* note 1, *supra*. Thus, the wireless market is already working in the precise manner Frontline is asking the FCC to mandate.

6. A carrier could face an open access or mandatory resale requirement that still permitted it to serve as a retailer. Indeed, the FCC implemented (and then reversed) a similar policy when it imposed a resale obligation on wireless carriers. In 1996, the FCC adopted a 2002 sunset date for the mandatory resale rule, concluding that with increasing competition, there was no need to actively manage the wireless market. *See Interconnection and Resale Obligations Pertaining to Commercial Mobile Radio Services*, First Report and Order, 11 FCC Rcd. 18455, 18457 (1996). In contrast, Frontline's proposed wholesale-only requirement can be viewed as an extreme form of mandatory open access. Under Frontline's proposal, the licensee would face an implicit open access requirement by virtue of its being prevented from serving as a retailer—that is, the line of business restriction on retail activity would effectively compel the licensee to resell its capacity to retailers.

incumbents at market rates. If too many firms compete for the arbitrage opportunity, however, then the rents will be dissipated.

The genius of the Frontline proposal is that, assuming the FCC is willing to unwind the wholesale-only obligation at some future date, the arbitrage opportunity is preserved *even if the market were to reject a wholesale-only business model*. Thus, it is essential for Frontline to acquire the E Block for as little money as possible. The proposal to ban from the auction all incumbent wireless carriers and cable operators facilitates this objective. Of course, this is not the first time that the FCC has considered barring incumbents or using “set-asides” in an auction. What makes this proposal unique is the joint restriction of the set-aside and the wholesale-only model, the effect of which would likely be to reduce the number of bidders on the E Block to a handful of inexperienced firms, including Frontline.

Frontline is effectively asking the FCC to award it the license, which we perceive as an implicit offer to participate in the arbitrage opportunity. Given the amount of money that would be in play—the last FCC auction raised nearly \$14 billion for the U.S. Treasury in September 2006<sup>7</sup> and the Congressional Budget Office estimates the 700 MHz auction could fetch as much as \$15 billion<sup>8</sup>—the opportunity for rent seeking is dangerously high. By rejecting Frontline’s proposals relating to the set-aside and the wholesale-only business models, the FCC can avoid another NextWave-style debacle.

This paper analyzes Frontline’s proposal from a cost-benefit perspective and reviews the Skrzypacz and Wilson report. Frontline’s economists advocate three requirements on the E Block licensee: (1) a requirement that the licensee not be an incumbent wireless operator or a cable operator, (2) a requirement to operate a wholesale-only business model, and (3) a requirement to accommodate public safety demands. We focus our attention on the first two requirements. It is not clear that public safety requires more spectrum,<sup>9</sup> and even if the FCC were to impose such a requirement, it is not clear that Frontline’s wholesale-only requirement would ensure that the licensee would be more accommodating to public safety demands than a licensee that operated free of a wholesale-only constraint.

Part II examines Frontline’s proposal to restrict entry in the auction. We explain why limiting the entities that bid in an auction is a bad idea under almost any circumstance. Frontline’s proposed entry restriction would likely decrease the intensity of the bidding, which would result in reduced auction proceeds.<sup>10</sup> Moreover, limiting the number of bidders would likely harm wireless consumers. Auctions generally ensure that resources get allocated to their highest valued use.

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7. FCC, Auction 66 Advanced Wireless Services (AWS-1), All Bidders Spreadsheet, available at <http://wireless.fcc.gov/auctions/66/charts/66bidder.xls>.

8. Richard Martin, *The FCC on Wednesday announced technical specifications for the upcoming 700-MHz auction, but put off deciding exactly how the spectrum will be divided and sold off*, INFORMATIONWEEK, Apr. 26, 2007, available at <http://www.informationweek.com/management/showArticle.jhtml?articleID=199201823>.

9. See, e.g., Peter Cramton, et. al., *Improving Public Safety Communications: An Analysis of Alternative Approaches*, Feb. 6, 2007, available at [http://www.criterioneconomics.com/docs/Improving\\_PublicSafetyComm\\_020507.pdf](http://www.criterioneconomics.com/docs/Improving_PublicSafetyComm_020507.pdf).

10. To an economist, the auction proceeds are a transfer from producers to the government, which means that they may not affect social welfare. To the extent that auctions are a more efficient way to raise revenue than taxation, however, then restrictions that reduce auction revenue could decrease social welfare.

Because incumbent carriers are in the best position to deploy the spectrum quickly, they are likely to value the spectrum the most. Thus, banning incumbent carriers would likely prevent the timely deployment of additional wireless broadband networks and capacity. As a result of this delay, consumers would be deprived for a certain period of new service offerings, including mobile text and photo-messaging, mobile game and ring-tone downloads, mobile music and video, mobile e-mail and web access, cardiac outpatient telemetry, and other remote medical diagnostic services. The consumer welfare losses associated with this delay could be substantial. Only a showing of extraordinary danger should convince the FCC to exclude bidders from an auction. Frontline's economists have not made such a showing; they argue that incumbents would purchase spectrum simply to block competition, without offering empirical evidence of similar behavior in the past or a theoretical model predicting anticompetitive behavior in the future. We explain why Frontline's proposal to exclude the "high-frequency" nationwide carriers (T-Mobile, Sprint/Nextel, and Alltel) and the cable operators does not flow from their theory of market failure (relating to AT&T's and Verizon's alleged market power). The section concludes with our review of the results of a previous attempt by the FCC to exclude incumbent wireless operators from a spectrum auction.

In Part III, we examine Frontline's proposal to impose a wholesale-only business model on the winning bidder of the E Block. In advocating a wholesale-only requirement, Frontline's economists reveal a naïve understanding of consumers' preferences for nationwide, mobile wireless services. In their view, an open-access provision would allow wireless retailers to ignore the "technical operation of the network," and instead "focus on their core competences—to run smaller or more customized operations."<sup>11</sup> Purchasing wireless service is not like purchasing a cup of coffee: Consumers want a consistent and uniform high quality of service at affordable rates. We demonstrate that artificially and arbitrarily limiting the business model for how spectrum is to be used is a bad idea under almost any circumstance. The FCC has made great strides in moving away from a command-and-control spectrum policy model, under which government tells a business how it should use its spectrum. Indeed, the idea of spectrum auctions was a gigantic first step in allowing the market to make the determination of the best business model, not regulators. We explain why the Frontline proposal is a major step backward from the market-oriented approach that has been used by the FCC in the spectrum space, and has worked extraordinarily well for consumers for the last decade. We also explain why Frontline's proposal to impose mandatory open access obligations on the winning bidder does not flow from their theory of market failure. If certain incumbents truly have significant market power, as Frontline alleges, then the best way to constrain that alleged market power is to allow the most efficient suppliers to acquire the spectrum. Anything less would result in reduced consumer welfare. The section concludes with our review of the previous attempt by the FCC to impose mandatory open access on wireline carriers.

In Part IV, we analyze Skrzypacz's and Wilson's allegations of market failure in the wireless industry. As the FCC has determined for the last eleven years, and the U.S. Department of Justice has repeatedly found, the wireless

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11. Skrzypacz & Wilson at 17.

market is highly competitive, and rivalry among wireless providers along both price and equipment dimensions is intense. Frontline's economists are wrong on several key, basic industry facts. For example, Skrzypacz and Wilson claim that the "coverage advantage" enjoyed by Verizon and AT&T (owing to their low-frequency spectrum) allow those carriers to charge higher prices than the other national carriers.<sup>12</sup> A review of the carriers' posted prices on their websites reveals that AT&T's and Verizon's prices (8.9 cents per minute for 450 minutes) are *identical* to those of Sprint/Nextel (8.9 cents per minute for 450 minutes), and are less than those of T-Mobile (13.3 cents per minute for 300 minutes plus unlimited calls to five numbers regardless of which carrier they use). The reason why the average *revenue* per minute for AT&T and Verizon are higher according to Merrill Lynch is unrelated to any alleged market power, but instead is likely explained by differences in the mix of offerings across carriers (for example, high-volume versus low-volume plans) and the type of customer attracted to each carrier (for example, prepaid versus subscription). Skrzypacz and Wilson also incorrectly claim that AT&T and Verizon "add customers at a faster rate than others."<sup>13</sup> In fact, T-Mobile is adding customers faster than AT&T.<sup>14</sup> Skrzypacz and Wilson also claim that since the mergers of AT&T-Cingular and Sprint-Nextel, the wireless industry "now has only four nationwide operators," leaving the market vulnerable to an exercise of market power.<sup>15</sup> The Department of Justice and the FCC found the specific mergers in question did not harm competition and were in the public interest, respectively. Even if there are only a handful of nationwide operators, it is not the number of suppliers that matters, but whether consumers currently enjoy the benefits of competition in terms of lower prices or greater output. In their simplistic counting exercise, the authors conveniently omit Alltel, arguably the fifth nationwide carrier,<sup>16</sup> which accounts for slightly more than five percent of total subscribers nationwide<sup>17</sup> and owns spectrum covering at least 79 million U.S. residents.<sup>18</sup> Indeed, Alltel's \$39 per

12. *Id.* at 13 ("The coverage advantage that Verizon and AT&T enjoy appears to enable them to charge higher per-minute prices than their PCS-only competitors, as shown in Figure 8.").

13. *Id.* at 3.

14. John C. Hodulik, Batya Levi, & Gaurav Jaitly, *UBS Investment Research, Wireless Services*, May 14, 2007, at 8 [hereinafter *UBS Investment Research*]; Robert Roche & John-Paul Edgette, *CTIA's Wireless Industry Indices: Semi-Annual Data Survey Results: A Comprehensive Report from CTIA Analyzing the U.S. Wireless Industry*, May 2007, at 64-77 (showing period over period industry-wide subscriber disconnects from June 1992 to December 2006); David Janazzo, Amy Lisogorsky & Michael Funk, *US Wireless Matrix 1Q07, Merrill Lynch Industry Overview*, May 21, 2007, at 15 (showing churn rates for each wireless provider).

15. *Id.* at 6.

16. See Alltel's National Freedom Plans, available at [http://www.alltel.com/personal/wireless/plans/plans\\_individual.html](http://www.alltel.com/personal/wireless/plans/plans_individual.html) ("National Freedom from Alltel offers extensive coverage at great rates. With this flexible plan, you're free to make calls to major U.S. cities and surrounding metropolitan areas in the Alltel national network — all without additional roaming or long-distance fees."); FCC, Eleventh Annual Report to Congress on the State of Competition in the Commercial Mobile Radio Services (CMRS) Industry, WT Dkt. No. 06-17, released Sept. 29, 2006, at 14 (noting that "Alltel has a very low roaming rate with Verizon Wireless which allows it to offer customers attractive national rate plans.") The FCC also notes that Alltel's customers perceive Alltel's service as being national. *Id.* (citing Simon Flannery & Jessica Yau, *Alltel Corporation, Conference Takeaways: On Track with Western Deal*, Morgan Stanley, Equity Research, May 5, 2005, at 1) [hereinafter *Eleventh Annual Report*].

17. *Eleventh Annual Report*, *supra* note 16, at tbl. 4.

18. ALLTEL CORP. ANNUAL REPORT, S.E.C. FORM 10-K, Dec. 31, 2006, at 2 ("As of December 31, 2006, Alltel owns a majority interest in wireless operations in 116 Metropolitan Statistical Areas ("MSAs"), representing approximately 48.2 million potential customers or POPs,

month nationwide plan includes 500 minutes, whereas the \$39 per month plan offered by Verizon, Cingular/AT&T, and Sprint/Nextel include only 450 minutes, implying that Alltel is offering a competitive product for nationwide service. In addition to innovative carriers such as Leap Wireless and MetroPCS, SpectrumCo, a consortium of cable providers, has just entered this market, creating yet another nationwide licensee. Skrzypacz and Wilson also suggest incorrectly that wireless prices are increasing by pointing to the rising monthly cellular bills since 1998.<sup>19</sup> The authors fail to scale the monthly expenditures by the number of minutes per month, as the FCC does in its annual wireless competition report to Congress, which reveals that wireless prices *on a per minute basis are actually falling*. These basic factual errors seriously undermine the authors' claims of market failure, and also cast doubt on their controversial policy prescriptions.

## II. SKRZYPACZ AND WILSON FAIL TO DEMONSTRATE THAT RESTRICTING ENTRY IN THE AUCTION WOULD INCREASE SOCIAL WELFARE

Bolstered by its economists' report, Frontline seeks to restrict certain participants from bidding on the E Block. Although Skrzypacz's and Wilson's written report is ambiguous as to the details of which entities should be excluded,<sup>20</sup> Frontline's economists were clear during a May 23, 2007 conference call that introduced their report to the press. In particular, Skrzypacz and Wilson advocated banning the participation of both incumbent wireless carriers and cable companies from the E Block in the 700 MHz auction.<sup>21</sup>

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and a majority interest in 239 Rural Service Areas ("RSAs"), representing approximately 30.7 million POPs. In addition, Alltel owns a minority interest in 23 other wireless markets, including the Chicago, Illinois and Houston, Texas MSAs.").

19. Skrzypacz & Wilson at 9 ("As shown in Figure 3, the inflation-adjusted monthly bill initially fell, but since 1999, consumers' monthly bills have been increasing.").

20. The report mentions several possible ways to exclude incumbent carriers from the E block, including a refusal to lease the E block to retailers affiliated with the incumbent carriers and using bidding credits for entrants. *See, e.g.*, Skrzypacz & Wilson at 4 ("We discuss here one sensible approach: the FCC demarcates some of the 700 MHz spectrum for a licensee that will commit to selling at wholesale to all buyers and *not primarily the top-two firms.*") (emphasis added). *See also id.* at 17 ("If the FCC prevents the operator from withholding or hoarding the spectrum (in ways discussed in the next section) then the operator will have the right economic incentives to offer such ubiquitous connectivity."). Unfortunately, there is no clarification offered in the next section.

21. Corey Boles, *Report Argues For Limits On Spectrum Auction Participants*, DOW JONES NEWSWIREs, May 23, 2007 ("On Tuesday a report by two Californian economists that was commissioned by Frontline Wireless, concluded that large incumbent telecom operators such as Verizon Communications (VZ) and AT&T Inc.'s (T) wireless units, should be partially restricted from taking part in the auction. Speaking on a conference call hosted by a law firm representing Frontline, economists Robert Wilson and Andrzej Skrzypacz of Stanford University Business School, argued that the same partial ban should be extended to the large cable companies too."). Dr. Wilson was later quoted in the article saying: "The incumbents have an enormous motivation to deter entry by competitors into their markets. They should be banned from bidding for this kind of specially-designated license." *Id.* Frontline's economists apparently offered the same policy prescription to a reporter from *Broadband Daily*. *See* Cheryl Bolen, *Economists Bolster Frontline Plan for Nationwide Broadband Network*, BROADBAND DAILY, May 23, 2007 ("Among the report's recommendations, the FCC should essentially exclude incumbents from bidding on the E Block license."). Wilson is later quoted as saying: "Because they have an undue incentive to deter entry,



Limiting the entities that bid in an auction is a bad idea under almost any circumstance. Limiting the number of bidders in the manner suggested by Frontline would likely harm wireless consumers. Auctions generally ensure that resources are allocated to their highest valued use: by limiting entry, as Frontline and its economists propose, the likelihood of an efficient allocation of the spectrum would be reduced significantly. Because the entities that are best positioned to deploy the spectrum quickly are likely the very ones who value the spectrum the most, the deployment and expansion of wireless broadband networks and capacity would be slowed. As a result, new service offerings such as photo-messaging, mobile music and video, and remote medical diagnostic services would be delayed. Moreover, limiting the number of bidders would almost surely decrease the intensity of the competition, which would decrease auction proceeds.<sup>22</sup>

Only a showing of extraordinary danger should convince the FCC to exclude bidders from an auction. Frontline's economists have not made such a showing; they have merely asserted that incumbents would purchase spectrum simply to block competition, without either an empirical or even theoretical basis for this argument. Indeed, this same proposition was advanced at the time of the FCC's original PCS auctions, when several companies, including Time Warner and MCI, sought to prevent incumbent wireless operators from bidding, arguing that the only reason for their participation would be spectrum warehousing. Based in part on sound economic analysis that showed how MCI's and Time Warner's anticompetitive concerns were easily overstated,<sup>23</sup> the FCC rejected the requests. The subsequent development of the wireless industry suggests the FCC should again exercise prescient judgment and reject the same requests by Frontline.

*A. Skrzypacz and Wilson Fail to Demonstrate That the Social Benefits from Restricting Entry Would Exceed the Social Costs*

The alleged basis for Skrzypacz's and Wilson's proposal to restrict entry in the auction is that incumbent carriers allegedly would participate in this auction only to foreclose entrants.<sup>24</sup> To exclude certain bidders from an auction, however, one must offer more than just theories of foreclosure. In particular, proponents of

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they should either be banned from bidding on the E Block or bidding credits should be given to new entrants." *Id.*

22. See note 10, *supra*, for the welfare implications of reducing auction revenues.

23. For an economic analysis of the spectrum warehousing hypothesis, see Stanley M. Besen, Robert J. Lerner & Jane Murdoch, *An Economic Analysis of Entry by Cellular Operators into Personal Communications Services*, Prepared for the Cellular Telecommunications Industry Association, Nov. 1992 (explaining the anticompetitive effects of allowing cellular providers to bid in PCS auctions depended on several factors, including the amount of spectrum allocated to PCS, the number of new licenses that are issued, the amount of spectrum that cellular licenses are permitted to acquire, and the precise definition of PCS.)

24. Skrzypacz & Wilson at 2 ("But this auction is the only major auction of low-frequency spectrum suitable for constructing coverage networks at low cost. AT&T and Verizon therefore have substantial incentives to acquire the 700 MHz spectrum, even if they have little intention to build on it for years to come, since winning the spectrum would deny this competitive advantage to rivals."). Wilson was more direct in his May 23, 2007 interview with Dow Jones: "I don't know why Verizon Wireless or AT&T, which already have national licenses, would want to participate in this proceeding. What good business reason could they have to buy another license in the low frequency other than to foreclose on potential competition."). See Corey Boles, *Report Argues For Limits On Spectrum Auction Participants*, DOW JONES NEWSWIREs, May 23, 2007.

restricting entry in the auction must demonstrate that (1) that there are no pro-competitive reasons for the incumbents' participation and (2) the proposed intervention will improve efficiency relative to allowing incumbent wireless operators to compete in the auction.<sup>25</sup> Frontline's economists fail to demonstrate that either condition is satisfied.

*1. Contrary to the Assertions Made by Skrzypacz and Wilson, the Two Largest Nationwide Wireless Operators Have Pro-competitive Reasons for Seeking to Acquire More Spectrum*

Skrzypacz and Wilson argue that the only possible motivation for the incumbent carriers' participation in the auction would be to foreclose rivals.<sup>26</sup> We refer to this potential motivation for bidding in the auction as the "Frontline anticompetitive hypothesis." Although they claim that their "fear" is "grounded in both economic theory and empirical analysis,"<sup>27</sup> Frontline's economists fail to offer a theoretical model or empirical evidence in support of their anticompetitive hypothesis. Moreover, Frontline's economists never consider pro-competitive reasons for an incumbent wireless carrier's participation in this auction.

To begin, nationwide wireless carriers, especially those lacking wireline broadband facilities such as T-Mobile, Sprint-Nextel, and Alltel, are seeking to offer mobile broadband service and need more spectrum to do so.<sup>28</sup> Even though AT&T and Verizon own wireline broadband facilities in their *regional wireline footprint*, in most parts of their *nationwide wireless footprint* they do not. Thus, they have strong incentives to compete against incumbent wireline broadband providers.<sup>29</sup> Indeed, even within their own regional footprint, AT&T's and Verizon's ability to offer wireless broadband could be an effective strategy against the incumbent cable modem provider, given the 700 MHz spectrum's superior propagation characteristics.<sup>30</sup>

25. The efficiency criterion considers the welfare of consumers and producers in both a static and dynamic sense.

26. Skrzypacz & Wilson at 2 ("AT&T and Verizon therefore have substantial incentives to acquire the 700 MHz spectrum, even if they have little intention to build on it for years to come, since winning the spectrum would deny this competitive advantage to rivals.").

27. *Id.* at 8.

28. See, Dan Frommer, *T-Mobile Leads Spectrum Bidding*, FORBES.COM, Aug. 16, 2006, available at [http://www.forbes.com/technology/2006/08/16/spectrum-auction-fcc\\_cx\\_df\\_0816fcc.html](http://www.forbes.com/technology/2006/08/16/spectrum-auction-fcc_cx_df_0816fcc.html) (showing that carriers need to add spectrum to bolster services or add new services).

29. Skrzypacz and Wilson suggest incorrectly that because AT&T and Verizon own fixed broadband facilities, they lack the incentive to compete against fixed broadband providers. See *id.* at 10 ("Because the two largest vertically-integrated wireless providers (AT&T and Verizon) are also wireline telephone companies that have made huge investments in DSL service, the current industry structure is not conducive to wireless becoming a third, independent competitive option for broadband access.").

30. The superior characteristics of the spectrum used to broadcast analog television have been widely reported. See, e.g., Catherine Yang, Heather Green & Tom Lowry, *Everybody Wants a Piece of the Air*, BUSINESS WEEK, July 5, 2005 ("The frequencies potentially up for grabs are among the best available, carrying signals for miles and traveling through walls."); *On the Same Wavelength*, THE ECONOMIST, Aug 12, 2004 ("The lower an electromagnetic wave's frequency the better it is at penetrating rain, trees and walls, which is why television and FM radio tend to work in the basement, but why Wi-Fi signals have trouble with walls. According to the New America

The growing popularity of wireless data services requires that incumbent carriers acquire additional spectrum.<sup>31</sup> To address these demands, wireless operators have introduced broadband services (based on technologies such as 1xEVDO and HSDPA).<sup>32</sup> The fact that wireless broadband and wireline broadband do not offer identical speeds is irrelevant to competition analysis; consumers are seeking wireless offerings to satisfy their *mobile* broadband needs. If wireless broadband services grow in popularity, those services will require much more bandwidth than the incumbent wireless operators currently control.<sup>33</sup> Apart from plans to offer broadband services, wireless carriers have a legitimate interest in adding spectrum to their current holdings to support the growing usage of voice services.<sup>34</sup>

Finally, Frontline's economists are quick to point out that wireless "incumbents *can* foreclose entry by outbidding new entrants in spectrum auctions."<sup>35</sup> Even if Skrzypacz and Wilson could establish that incumbent wireless carriers have the *ability* to foreclose entrants by outbidding them in the auction, such proof would not establish the fact that incumbent carriers have the *incentive* to do so. For example, if the out-of-pocket cost of foreclosing a rival in

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Foundation, the 1% of frequencies below 3GHz are worth more than the other 99% of spectrum between 3GHz and 300GHz.").

31. The need for additional spectrum is readily apparent from numerous commentators on the industry. For example, Samsung perceives broadcast television as a source of video content because spectrum for data services was too limited to support the additional video given data service needs. See Li Yuan, *Cellphone Video Gets on the Beam—Samsung's New Technology Enables Reception of Digital TV Broadcasts*, WALL ST. J., Jan. 4, 2007, at B3 ("The new technology, being developed by the company's Samsung Information Systems America subsidiary, also has advantages over existing delivery systems because it doesn't use up bandwidth on the wireless network, the company says. This avoids taking space from other data-heavy services such as Web browsing and social networking that carriers are hoping will provide new revenue streams."); *On the Same Wavelength*, THE ECONOMIST, Aug 12, 2004 ("Most industry participants, however, are keen for more open spectrum. One opportunity that will present itself in many countries is the migration from analogue to digital television, which will reduce the bandwidth needed for traditional free-to-air broadcasters."); *The Spectrum Game*, WALL ST. J., Apr. 17, 2007, at A18 ("These licenses are especially coveted by wireless carriers because the spectrum can more easily penetrate homes and office building interiors and cover loosely populated rural areas. The spectrum also can support the new voice, video and data offerings that require more bandwidth.").

32. In addition to the four largest nationwide carriers, other carriers offer EV-DO-based mobile broadband services. See e.g., Testimony of Steve Largent, Before the U.S. House of Representatives Subcommittee on Telecommunications and the Internet Committee on Energy and Commerce, May 17, 2007, available at [http://energycommerce.house.gov/cmte\\_mtgs/110-ti-hrg.051707.Largent-testimony.pdf](http://energycommerce.house.gov/cmte_mtgs/110-ti-hrg.051707.Largent-testimony.pdf) (listing the EV-DO developments of Alltel, Alaska Communications Systems, Cellular South). More than half of all wireless consumers in the U.S. have web-capable devices, and 59 percent of all broadband subscriber additions in the first half of 2006 were mobile wireless subscribers. *Id.* (citing statistics from M:Metrics reports).

33. See, e.g., Tim Luke et. al., *Mobile Television: I Want My 'M-TV'*, *Lehman Brothers Sector View: Technology*, Aug. 3, 2006, at 7 (showing that five subscribers using streaming video on Verizon's EV-DO network could use up enough bandwidth to disrupt service on one cell site). See, also *Mobile TV predicted to be a hit*, BBC NEWS, May 9, 2007 (noting that mobile video using 3G spectrum effectively limited the number of users in a two-kilometer radius to 15), available at <http://news.bbc.co.uk/2/hi/technology/6639249.stm>.

34. See, e.g., Robert Roche & John-Paul Edgette, *CTIA's Wireless Industry Indices: Semi-Annual Data Survey Results: A Comprehensive Report From CTIA Analyzing the U.S. Wireless Industry*, May 2007, at 16-20 (showing period over period subscriber growth from June 1985 to December 2006, except for December 2000); David Janazzo, Amy Lisogorsky & Michael Funk, *US Wireless Matrix 1Q07, Merrill Lynch Industry Overview*, May 21, 2007, at 7 (showing quarterly growth in minutes of use through year-end 2006).

35. Skrzypacz & Wilson at 11 (emphasis added).

an auction is \$5 billion, but the gain from doing so (in terms of less competition) is \$4 billion, then an incumbent wireless carrier will lack the incentive to engage in a foreclosure strategy. Moreover, because the benefits of foreclosure would be enjoyed by *all* incumbents, it would be tempting for each incumbent to free ride off the expenditure by the winning bidder. Without a way to share in the significant cost of foreclosure, it seems unlikely that such conduct would occur. Finally, auction theory has shown that incumbent bidders exercise market power by accommodating entrants in an effort to keep prices low on the spectrum that they themselves win.<sup>36</sup> Indeed, the FCC's blind-bidding rule was first proposed by the FCC for the AWS auction to encourage incumbent carriers *to bid more aggressively* in spectrum auctions.<sup>37</sup> Skrzypacz and Wilson fail to provide the relevant calculus demonstrating that incumbent wireless carriers would be better off by foreclosing entrants in this auction. Without a showing of both the incentive and the ability to foreclose entrants, Skrzypacz's and Wilson's description of the "dominant low-frequency incumbents' incentives" is an empty catchphrase.<sup>38</sup>

## 2. *Skrzypacz and Wilson Fail to Demonstrate That Restricting Entry Would Improve Efficiency Relative to the Status Quo*

Skrzypacz and Wilson never attempt to balance the alleged benefit of their proposal to limit entry against the cost. In the absence of a rigorous cost-benefit analysis, we provide an informal analysis here. On the social benefit side, proponents of a set-aside would point to entry by new firms, especially resellers of voice service. Such entry might result in lower prices of existing voice services. This is unlikely; the key is who owns the spectrum (scarce resource) and not who offers the service. The wholesale-only provider can extract rents by raising its wholesale prices to its Mobile Virtual Network Operators (MVNOs), ensuring that the resulting prices to customers are no lower than other carriers' prices. Indeed, as we demonstrate in Part III.A.1.b., under Frontline's proposal, the E Block licensee would have strong incentives to set its wholesale price just below the market-determined wholesale price, leaving little room for resellers to affect retail prices. In any event, Frontline's economists never quantify those alleged benefits. On the social cost side of the equation, we would point to (1) reduced auction proceeds<sup>39</sup> and (2) slower deployment of wireless broadband networks. Frontline's economists never consider the costs of denying access to certain entities, let alone try to quantify those costs. For this reason, their analysis is incomplete.

Although it is not our burden to prove that the costs of excluding certain bidders exceed the benefits, we are fairly certain this is the case. As we demonstrate in Part IV, the *price of wireless voice services (measured on a per*

36. See Peter Cramton & Jesse Schwartz, *Collusive Bidding in the FCC Spectrum Auctions*, 1 CONTRIBUTIONS TO ECONOMIC ANALYSIS & POLICY, available at [www.bepress.com/bejeap/contributions/vol1/iss1/art11](http://www.bepress.com/bejeap/contributions/vol1/iss1/art11), 2002.

37. Auction of Advanced Wireless Services Licenses Scheduled For June 29, 2006, Notice and Filing Requirements, Minimum Opening Bids, Upfront Payments and Other Procedures for Auction No. 66, AU Dkt. No. 06-30, released Apr. 12, 2006, ¶¶ 140-41, available at [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/FCC-06-47A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-06-47A1.pdf).

38. Skrzypacz & Wilson at 4.

39. See note 5, *supra*, for the welfare implications of reducing auction revenues.

*minute basis*) has declined by 84 percent in the last decade. It is hard to conceive of the possibility that adding a wholesale-only provider (and its associated resellers) would accelerate that price trajectory significantly. On the other side of the ledger, we believe the costs of banning incumbent carriers could be economically significant. Given the likely value of the E Block spectrum to incumbent wireless carriers, the shortfall to the U.S. Treasury could be in the billions of dollars. Because the auction proceeds are a transfer from the producers to the government, a decline in auction proceeds reduces social welfare only to the extent that auctions are a more efficient means to raise revenues than taxation.<sup>40</sup>

The costs associated with the slower deployment and expansion of wireless broadband networks would also be significant. Given the great willingness to pay for bandwidth-intensive broadband applications such as massively multiplayer online games (MMOG) delivered over a wireline connection, it is reasonable to infer that the same applications will be in great demand by wireless customers. Delaying their ability to enjoy those services means that the consumer surplus associated with downloading mobile videos or playing mobile video games would be postponed indefinitely. The reduction in the present value of the consumer surplus could quickly swamp the costs associated with the expected decline in auction proceeds. Combined, the costs of excluding incumbent carriers would likely exceed the benefits of injecting more competition for wireless voice services at the retail level.

*B. Skrzypacz's and Wilson's Proposal to Limit Certain Entities That Bid in an Auction Does Not Flow from Their Theory of Harm*

To address the alleged anticompetitive motivation of incumbent carriers, Frontline's economists advocate an outright ban on the incumbents' participation in the auction; short of that, they advocate the use of bidding credits to ensure that incumbents cannot outbid entrants for the spectrum. Skrzypacz and Wilson argue that AT&T and Verizon have an inherent advantage over other carriers due to (1) their coverage advantage owing to lower-frequency "cellular band" spectrum,<sup>41</sup> and (2) their ability to offer the "quadruple play" of wireline voice, wireline broadband, wireless, and video.<sup>42</sup> Frontline's economists fail to document the economic significance of these alleged advantages. For example, standalone wireless offerings, such as those offered by Sprint/Nextel, T-Mobile, and Alltel, are thriving, suggesting that the alleged benefits of the quadruple play

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40. A standard assumption in regulatory economics is that each dollar spent by the government is raised through distortionary taxes. The "shadow costs of public funds," which recognizes these distortions, has been estimated to be 30 percent—that is, each dollar raised through taxation imposes a cost on society of roughly \$1.30. See JEAN-JACQUES LAFFONT & JEAN TIROLE, *A THEORY OF INCENTIVES IN PROCUREMENT AND REGULATION* 38 (MIT Press 1994).

41. Skrzypacz and Wilson at 2 ("Verizon and AT&T have the great advantage of owning spectrum derived from the original cellular grants in the late 70s and early 80s, which like the 700 MHz spectrum, came from UHF channels. The long wavelengths, relative to PCS or AWS spectrum, lead to unique coverage advantages.").

42. *Id.* ("Additionally, the two leading firms each have even greater shares in their home wireline markets, and are in a unique position to offer a triple play of wireless service, broadband (DSL or fiber), and wireline phone. As they build out their fiber optic facilities they will offer a quadruple play that also includes video programming.").

are not grounded in serious economic analysis. Indeed, Alltel<sup>43</sup> and Sprint/Nextel<sup>44</sup> recently divested their wireline properties, which implies that they do not believe the triple-play bundle is necessary to compete effectively against AT&T and Verizon. To the extent that a bundled offering with wireless and wireline services is necessary to compete effectively, that bundle could be created by two or more firms (for example, Embarq is reselling Sprint/Nextel wireless and Qwest is reselling Sprint/Nextel). It is also not clear that AT&T and Verizon have a coverage advantage *from the perspective of consumers*. According to a survey by J.D. Power & Associates, T-Mobile ranks highest in the Call Quality Index (a customer satisfaction rating) in many regions of the country.<sup>45</sup>

The core of Skrzypacz's and Wilson's exclusion argument is that to increase competition it is necessary to reduce the number of certain kinds of competitors. They bear a heavy burden of empirical proof to demonstrate this hypothesis. In particular, they must show that (1) some wireless providers wield substantial (if not monopoly) market power; (2) these providers have both the means and incentive to purchase spectrum and warehouse it (that is, not use it); and (3) the appropriate remedy to this problem is excluding these providers from bidding<sup>46</sup> for the 700 MHz spectrum. Only those providers that pass the above three strong empirical screens are to be enjoined from bidding. Clearly, they fail to carry this burden for the first three empirical tests (in fact, they make no attempt to empirically demonstrate their assertions at all). Even if Skrzypacz's and Wilson's theory of harm is correct, it does not follow that Sprint/Nextel, T-Mobile, and Alltel should be banned from the auction. By no stretch of the imagination can these carriers be considered to have market power. It is curious why Skrzypacz and Wilson recommend that they be excluded from bidding. Nor does it follow that the cable companies should be enjoined from bidding. By virtue of their existing nationwide coverage, these carriers are in the best position to compete with AT&T and Verizon in the short run; they should not be denied access to the

43. Press Release, Alltel Spins Off Wireline Business and Merges It with VALOR, Creates New Rural-Focused Wireline Company, available at <http://www.alltel.com/corporate/media/news/05/dec/spinrelease120905.pdf>.

44. On May 17, 2006, Sprint/Nextel completed the spin-off of Embarq, Sprint's former local wireline communications company. See SPRINT/NEXTEL 2006 ANNUAL REPORT, S.E.C. FORM 10-K, Mar. 1, 2007, at 55 ("We believe this separation presents the opportunity for enhanced performance of each of the two companies, including: allowing each company separately to pursue the business and regulatory strategies that best suit its long-term interests and, by doing so, addressing the growing strategic divergence between Embarq's local wireline-centric focus and our increasingly national wireless-centric focus; creating separate companies that have different financial characteristics, which may appeal to different investor bases; creating opportunities to more efficiently develop and finance expansion plans; and creating effective management incentives tied to the relevant company's performance.")

45. J.D. Power and Associates Reports: *The Number of Call Quality Problems Experienced with a Wireless Service has Declined for a Second Consecutive Year*, Mar. 16, 2006, available at <http://www.jdpa.com/pdf/2006037.pdf>.

46. Assume that the two largest wireless carriers are in possession of significant market power, and that there is a serious threat that they will abuse that power, as Skrzypacz and Wilson assert. Although these conditions would give rise to an antitrust problem, it does not follow that the best remedy would be to enjoin them from bidding in the auction. If Frontline believes there are significant antitrust problems here, then it should bring a case to the antitrust agencies, or better yet, it should bring a private antitrust suit. The FCC seems to be a peculiar venue for pursuing an antitrust action.

low-frequency spectrum. By reducing the amount of spectrum available to all incumbent carriers, the Frontline proposal would raise the cost of the available spectrum to the “high-frequency” PCS band carriers, thereby reducing the likelihood that they become more effective competitors.

Frontline’s economists are essentially arguing that *de novo* entry by an unproven competitor with a speculative business plan is more likely to increase competition than allowing the “high-frequency” wireless carriers to bid for the spectrum. Similarly, if the quadruple play is critical to competing effectively against AT&T and Verizon, then cable companies should not be excluded from the auction. Because they already offer video, data, and voice service, cable companies are in the best position to compete for bundled offerings in the short run.

Frontline’s attempt to exclude the most viable competitors from the auction reveals their likely motivation: to fully exploit the arbitrage opportunity created by set-asides—that is, to acquire the spectrum at its lowest possible price and to sell the spectrum at its highest possible price. Of course, to complete the arbitrage play would require that the FCC nullify the wholesale-only requirement at some date in the future. In the event that the wholesale-only model proves to be a failure, there will be tremendous political pressure to reallocate the spectrum to its most valuable use. Thus, the likelihood that the wholesale-only restriction would be relaxed (conditional on the restriction initially being imposed) is very high.

Alternatively, if Frontline is successful in this attempt to cajole the FCC into placing all these restrictions on this auction, Frontline is likely to be the only firm bidding successfully for this spectrum, which implies that Frontline would obtain the spectrum far below the true market price. They can then use their position as the 700 MHz bottleneck to wring profits from the resellers they hope to attract by pricing their wholesale service to those resellers accordingly. Frontline’s ability to extract rents from their control over the 700 MHz spectrum would be limited only by the incumbent carriers’ existing wholesale offerings, which in turn are price-constrained by the carriers’ retail offerings.<sup>47</sup>

### *C. Skrzypacz and Wilson Fail to Consider the Unintended Consequences of Previous Efforts to Restrict Entry in U.S. Wireless Auctions*

As proponents of set-asides in auctions, one would expect Skrzypacz and Wilson at least to mention the recent NextWave experience. Yet the phrases “NextWave,” “C Block,” or “C Block Reauction” cannot be found in the text of their report. (The last two are listed in a figure but not in the text.) Because the NextWave experience is highly relevant to their proposal to exclude incumbent wireless operators from the E Block, we review the basic facts of the NextWave experience here.

At the urging of Congress, the FCC has attempted to induce competition in wireless services by creating a special class of carriers, known as designated entities (DEs). These entities have been given preferential treatment in spectrum auctions, a policy that has created incredible confusion and a lengthy court battle.

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47. If a wireless incumbent offers both wholesale and retail services, its best strategy is to equate its wholesale price to its retail price less the marginal cost of retailing. If the wholesale price were significantly greater, then the firm should embrace a wholesale-only model; if the wholesale price were significantly smaller, then the firm should embrace a retail-only model.

Congress instructed the FCC to seek ways to achieve diversity in the ownership of spectrum licenses.<sup>48</sup> With the best intentions, the FCC implemented several complex schemes that were exploited by sophisticated companies in FCC Auction #5, which began in December 1995. First, the FCC set aside large swaths of spectrum for DEs—that is, for carriers believed to be too small to compete for this spectrum.<sup>49</sup> The FCC also provided the DEs bidding credits in these auctions, which allowed them to purchase licenses at a fraction of the cost that non-DEs were willing to pay. Finally, the FCC offered generous financing plans to DEs that enabled them to defer payments on winning bids for up to ten years.

NextWave, a small company created for the purpose of bidding on the set-aside spectrum, was one of the first firms to take advantage of the FCC's new program. In 1996, NextWave had a total of \$4.2 billion in winning bids at the conclusion of Auction #5.<sup>50</sup> Even though the winning bidders were allowed to defer their payments on this spectrum over ten years (interest payments only for the first six years, principal and interest payments over the last four years),<sup>51</sup> NextWave failed to make its scheduled payments on its licenses and entered bankruptcy. In response, the FCC reclaimed the licenses and re-auctioned them in 2000.

Seemingly unfazed by the NextWave experience, the FCC again reserved certain portions of the spectrum for “entrepreneurial” firms in a December 2000 re-auction of the NextWave spectrum, Auction #35. In particular, the FCC prevented the participation of any firm in the set-aside portion of the auction that was “controlled” by a firm with assets in excess of \$500 million or annual revenues in excess of \$125 million. This control standard was intended to promote diversity among wireless carriers and to increase competition after the auction, while allowing small carriers to gain improved access to investment capital from larger telecommunications firms. Even under this control standard, certain large carriers indirectly gained access to the set-aside spectrum by guaranteeing financing and obtaining minority interests in companies that were created in response to the FCC's perverse rules—that is, by restricting their access to the spectrum directly, incumbent carriers were forced to pay third parties for their spectrum under the set-aside program.

NextWave then sued the Commission for violating the bankruptcy laws, and the Supreme Court decided in January 2003 that the FCC did not have the authority to supersede the bankruptcy court in its role as creditor to NextWave.<sup>52</sup> As a result of the court challenge, the FCC was forced to negate its 2000 re-auction of the spectrum that NextWave claimed. Thus, for more than six years (1996 through 2003), a significant share (30 MHz of 170 MHz of cellular and PCS licenses) of the total spectrum available to U.S. wireless carriers was tied up

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48. 47 U.S.C. § 309(i)(3)(A).

49. Initially, these designated entities were to include minorities and women, but the federal courts decided that such set-asides were unconstitutional.

50. Downloaded from FCC's web site at <http://wireless.fcc.gov/auctions/05/charts/5hbidding.gif>.

51. Implementation of Section 309(j) of the Communications Act, Competitive Bidding, Sixth Report and Order, PP Dkt. No. 93-253 (released July 18, 1995).

52. Fed. Comm. Comm'n v. Nextwave Personal Comm., Inc., 537 U.S. 904 (2003).



in the courts, and the U.S. Treasury was unable to collect NextWave's winning bids.

The primary cost of the FCC's asymmetric treatment of wireless carriers is that it distorts investment decisions of both incumbent carriers and new entrants. Moreover, if these policies succeed in placing spectrum in the hands of small, inexperienced owners, such as NextWave, they do little to contribute to the quality of wireless service, which today are offered in a competitive marketplace with four or more carriers providing service in most markets. In the case of NextWave, the asymmetric bidding policy not only did not achieve its objectives, but for several years it deprived consumers of the competition that would have resulted from the productive use of the spectrum that NextWave obtained in the auction. It would be a tragedy to repeat the Nextwave experience here.

### III. SKRZYPACZ AND WILSON FAIL TO DEMONSTRATE THAT IMPOSING A WHOLESALE-ONLY BUSINESS MODEL WOULD INCREASE SOCIAL WELFARE

Limiting the business model for which the spectrum is to be used is also a bad idea under almost any circumstances. In particular, consumers would be harmed because incumbent wireless operators, the entities whose proven track record suggests that they are best able to quickly deploy the spectrum to provide service, would be deprived of the additional spectrum they need to offer more mobile wireless broadband services in more locations. Skrzypacz's and Wilson's proposal to constrain the use of the spectrum to a wholesale-only model rejects more than a decade of market-oriented spectrum policy. The FCC has made great strides in moving away from a command-and-control model in which the government tells a business how it should operate its spectrum. Indeed, the idea of spectrum auctions was a gigantic first step in allowing the market participants (firms and consumers) to make the determination of the best business model, not regulators. The result has been nothing short of spectacular, as prices on a per-minute basis have declined and quality of service has improved. According to a J.D. Power and Associates survey released in March 2007, the overall rate of customers experiencing a wireless call quality problem declined for a third consecutive year.<sup>53</sup> In this section, we review Skrzypacz's and Wilson's arguments in favor of imposing a wholesale-only restriction on the licensee. Next, we explain why their proposal to constrain the licensee does not flow from their theory of harm. Finally, we revisit the most recent effort by the FCC to impose mandatory unbundling requirements on wireline providers.

#### A. *Skrzypacz and Wilson Fail to Demonstrate That the Social Benefits from Imposing a Wholesale-Only Model Would Exceed the Social Costs*

Proponents of regulatory intervention must demonstrate that their proposal would improve social welfare on net. Frontline's economists assert that their second restriction relating to a wholesale-only business model would generate private benefits for wireless retailers and regional providers:

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53. J.D. Power and Associates Reports: *Wireless Call Quality Problems Continue to Decline as the Transition to 3G Networks Takes Hold*, Mar. 15, 2007, available at <http://www.newscom.com/cgi-bin/prnh/20050527/LAF028LOGO-a>.

An open-access regime on just a small portion of the newly-available 700 MHz spectrum would make these coverage benefits available to whole classes of new entrants and existing rural/regional CMRS providers. The competitive benefits would be dramatic. Most importantly, these benefits can be realized by requiring open access on only a small portion of the CMRS spectrum.<sup>54</sup>

Skrzypacz and Wilson fail to quantify the private benefits of a wholesale-only restriction to wireless retailers and regional providers. Moreover, they make no attempt to demonstrate how those private benefits would redound to the benefit of consumers. In previous attempts to impose open-access requirements on wireline carriers, the access seeker has failed to share the regulatory arbitrage opportunity (equal to the difference between the retail price and the regulated wholesale price) with end users.<sup>55</sup> Frontline's economists also fail to compare the alleged benefits of an open access-only requirement to the benefits of the next best alternative use of the spectrum—namely, selling the E Block with no line-of-business restriction. In this section, we attempt to perform the relevant cost-benefit analysis.

#### *1. Alleged Benefits of Constraining the Licensee to Employ a Wholesale-Only Business Model*

Skrzypacz and Wilson argue that requiring the E Block licensee (and by extension, all 700 MHz licensees) to employ a wholesale-only business model would (1) impose additional pricing constraints on incumbent wireless carriers<sup>56</sup> and (2) unleash a new wave of innovation among wireless providers.<sup>57</sup> As we demonstrate in Part IV below, the U.S. wireless industry is characterized by rapidly decreasing prices and a high level of innovation at both the application and device layers. Thus, it is highly unlikely that the government intervention sought here (imposing a specific business model on a licensee) would improve upon either of those dimensions. Even if Frontline, acting as an open-access licensee, could impose additional price discipline on incumbent carriers relative to the status quo, it is not clear that those benefits would exceed the benefits of not imposing such a requirement, but instead allowing the licensee to compete against incumbents in whatever way they see fit. In this section, we explore the alleged benefits of constraining the E Block licensee to employ a wholesale-only business model.

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54. Skrzypacz & Wilson at 14.

55. See Part III.C., *infra*.

56. Skrzypacz & Wilson at 19 (“The 1.9 GHz spectrum is presently the “marginal spectrum,” meaning that wireless prices are largely determined by the cost of providing service using frequencies in the 1.9 GHz spectrum. The better propagation properties of the low-frequency spectrum translate to lower marginal costs to develop wide-area network connectivity. Hence, if access to a network using the more efficient spectrum becomes open, the price of access will be determined by that lower cost, leading to lower prices, especially in low-density and rural areas.”).

57. *Id.* (“An open-access network assures connection to a nationwide network on non-discriminatory terms, and protects entrants from future hold-up actions by dominant incumbents. This assurance creates new opportunities for entrepreneurs and small businesses, and unleashes their creative abilities in devising products and services.”).

*a. An Unrestricted Auction Would Not Preclude a Licensee from Employing a Wholesale-Only Business Model*

With respect to the E Block, the choice facing the FCC is whether to mandate an untested business model favored by one company that has never provided service or constructed a network, or to allow the market participants (firms and consumers) to choose the business model. Nothing prevents a wireless licensee from adopting a wholesale model on its own. Indeed, as noted earlier, AT&T, Sprint/Nextel, Verizon Wireless, and T-Mobile all serve as wholesalers to many wireless resellers, in addition to serving as retail service providers. To generate support for Frontline's open-access restriction on the E Block licensee, however, Skrzypacz and Wilson present the Commission a false choice:

This solution enables the FCC to eliminate the bottleneck on access to wide-area networks. It avoids *de facto* endorsement of vertical integration as the *only viable business model*, and reasserts the Commission's expressed intent to promote competition in the market for wireless services.<sup>58</sup>

Rejecting Frontline's wholesale-only restriction, as we are inclined to do, is not tantamount to embracing a particular incumbent model. Instead, one can reject their proposal by trusting that the market will determine the appropriate business model or models. There is no *a priori* reason to believe that the market could not support a wholesale-only business model. It is Frontline, not its opponents, who is attempting to circumvent the market and have regulators impose their particular "only viable business model" for the E Block auction. Moreover, to the extent there is a "bottleneck on access to wide-area networks," Frontline would control the bottleneck for the 700 MHz E Block spectrum under its proposed wholesale-only model. The fact that Frontline would have many resellers does not change the nature of the bottleneck; it does mean that Frontline would be able to exploit that bottleneck in the price it charges to resellers, who of course must pass this bottleneck price on to consumers.

The light hand that the FCC has applied to spectrum auctions to date has allowed licensees to adopt a wide mixture of business models, from the blend of wholesale and retail services employed by the five national carriers to the retail-only model (TracFone, Disney Mobile, and Virgin Mobile) to the wholesale carriers' carrier roaming model (Commnet Wireless<sup>59</sup>). The Frontline proposal represents a major step backward from the market-oriented approach that has worked and characterized the FCC's actions in the spectrum space for more than a decade. In summary, an open-access requirement such as the one proposed by Frontline is not a necessary condition to achieve a wholesale-only model in the wireless marketplace.

*b. A Government-Mandated Wholesale-Only Business Model Would Not Likely Impose Additional Constraints on the Prices Charged by Incumbent Wireless Carriers*

Skrzypacz and Wilson fail to model how a licensee subjected to a wholesale-only restriction would constrain the prices of incumbent wireless operators *over*

58. *Id.* at 5 (emphasis added).

59. Information about Commnet Wireless is available at <http://www.commnetwireless.com/>.

*and above the significant competitive constraints incumbents currently face.* Given the high fixed costs associated with building a wireless network, marginal-cost pricing would not be feasible. To the extent that a wholesale-only business model for a single provider would nudge prices towards marginal costs, there is scant room for downward movement: According to the FCC's latest wireless competition report, the average revenue per minute was \$0.07, down from \$0.18 per minute in 2000.<sup>60</sup> More importantly, Frontline's economists avoid the critical question of access pricing that is at the heart of any mandatory unbundling regime. The following paragraph represents the *entirety* of their discussion on access pricing:

**Pricing.** To guarantee a level playing field, we recommend a transparent openly available tariff with a menu of contracts and services. This tariff is required to be nondiscriminatory, enforced by Most-Favored-Nation provisions that ensure no discrimination by the identity of the retail service provider. Because the market can support many different business models, we envision different firms wanting different forms of contracts and services. Hence we expect that the tariff's menu of options can depend on economic variables, for example the interconnection standard, congestion conditions, location, service priority, etc. As an alternative to a fixed tariff, an auction mechanism might provide additional price transparency.<sup>61</sup>

As the above quote reveals, Skrzypacz and Wilson do not offer any specifics regarding the regulated wholesale rate beyond a non-discrimination provision. Although most "tariffs" are regulated, it is not clear from the above language whether Frontline seeks to impose regulated prices in the wireless market. Thus, Frontline's economists conveniently avoid the messier issue of determining the regulated wholesale access price. If the E Block licensee sets a non-discriminatory wholesale rate that is very high—that is, if the licensee appropriates 100 percent of the potential margin—then a retailer who leases the licensee's network will not be capable of charging a competitive retail price and the alleged benefits of the unbundling experiment would be nullified. Basic economic logic dictates that the E Block licensee would have little incentive to set its wholesale rate significantly below the market-determined wholesale rate, which is established by integrated carriers who consider the opportunity cost of the retail margin when setting their wholesale rates. Stated differently, under Frontline's proposal, we expect the E Block licensee would set its wholesale rate just below the unregulated wholesale rate.

An unregulated wholesale rate (or some price right below it) will generally not allow the retailer—even one who leases access from the E Block licensee—to earn a large profit unless the retailer can exploit untapped markets (such as the targeting of Hispanic customers by TúYo Mobile, which leases capacity from T-Mobile) or can provide retail services at lower costs. The latter is unlikely due to the significant economies of scope in wireless telephony between performing the wholesale function and the retail function. With its small profit margin, the retailer who leases from the E Block licensee would not be in a position to constrain the price of incumbent operators.

60. *Eleventh Annual Report*, *supra* note 16, at Table 10.

61. Skrzypacz & Wilson at 17.

To see why, consider the following example. Suppose that the cost per minute of providing wholesale access is \$0.03, the market-determined retail price is \$0.07 per minute, and the avoided retail cost is \$0.02 per minute. Under these assumptions, a vertically integrated operator earns a margin of \$0.02 per minute (equal to \$0.07 retail price less \$0.03 wholesale cost less \$0.02 retail cost). The vertically integrated operator is indifferent between serving as the retailer and serving as a wholesaler with a wholesale rate of \$0.05 per minute,<sup>62</sup> which generates a wholesale margin of \$0.02 per minute (equal to \$0.05 access charge less \$0.03 wholesale cost). Because the E Block licensee would be the *only* provider who was restricted by regulation from offering retail services, the E Block licensee would likely establish a wholesale rate just below the unregulated rate of \$0.05. At a \$0.05 wholesale rate, however, the retailer's margin, assuming it was as efficient in providing retail services as the incumbent operators, would be \$0.00 (equal to \$0.07 retail price less \$0.05 access charge less \$0.02 retail cost). Thus, a retailer would not voluntarily enter into an agreement with an unregulated wholesaler unless the retailer was *more efficient* than incumbent operators at providing retail services. Given the low likelihood of this contingency, Frontline's refusal to commit to a regulated wholesale price implies that its wholesale-only proposal would not permit its resellers to significantly constrain the pricing of incumbent operators. In summary, the implementation of Frontline's wholesale-only service requirement is not clear: either it is proposing access price regulation, which would likely decrease social welfare, or it is not, in which case retail prices under Frontline's model would not be any lower than they are now.

*c. An Untested Wholesale-Only Business Model Would Not Likely Spur Incremental Innovation by Wireless Resellers*

Frontline's economists argue that a wholesale-only requirement will spur entry among wireless retailers.<sup>63</sup> Setting aside the access-pricing issue raised above, which implies that resellers would not constrain market prices without regulated wholesale rates, Skrzypacz and Wilson ignore the current activity among retail-only firms in the absence of open access restrictions on spectrum. Firms such as Disney Mobile, TracFone, Helio, and Virgin Mobile have entered the market as MVNOs, which involves reselling wireless capacity of an incumbent operator under a different brand name, producing differently branded handsets, and offering differentiated content in many instances.<sup>64</sup> The wide variety of categories of MVNOs, which range from "Prepaid" to "Ethnic" to "Youth," and the diversity of their product and pricing demonstrates the niche markets that are now being served by new entrants taking advantage of existing wholesale opportunities provided by incumbents.<sup>65</sup> Once again, it is the burden of Frontline's economists to demonstrate that their open-access requirement would

62. The market-determined wholesale access rate,  $A$ , can be solved for by equating the wholesale margins,  $A - C_w$ , with the profits of a vertically integrated operator,  $P - C_R - C_w$ , where  $P$  is the retail price,  $C_R$  is the retail cost, and  $C_w$  is the wholesale cost. See, e.g., Robert W. Crandall & Hal J. Singer, *Life Support for ISPs*, REGULATION (Fall 2005).

63. Skrzypacz & Wilson at 19.

64. See THOMAS WINTER AABO, U.S. MOBILE VIRTUAL NETWORK OPERATORS 2007: THE DEFINITIVE GUIDE AND CRITICAL ANALYSIS OF THE U.S. MVNO MARKET, Mind Commerce, Mar. 2007.

65. *Id.* at 11.

stimulate additional entry at the retail level *relative to some benchmark*, which at a minimum is the status quo. It is not clear that a wholesaler in the E Block that is free to set a (nondiscriminatory) wholesale access price would present better opportunities for resellers than incumbent wireless operators are already offering.

## 2. *The Costs of Constraining the Licensee to Employ a Wholesale-Only Business Model*

In the previous section, we explained that Frontline's wholesale-only requirement would not likely generate benefits relative to the status quo. The more relevant benchmark, however, is the best use of the E Block, which presumably would be to auction the spectrum to all potential bidders, including incumbent operators and cable providers, *free from a wholesale-only requirement*.

### a. *Imposing a Wholesale-Only Restriction Would Likely Prevent the Spectrum from Being Deployed in the Most Efficient Way*

Economists prefer auctions to beauty contests because auctions ensure that resources are allocated to their most valuable use. By seeking a wholesale-only requirement, Frontline is effectively asking the Commission to embrace a beauty contest in which Frontline is the only contestant. It is asking the FCC to adopt Frontline's business model, not as one possible outcome of a competitive marketplace, but rather as a constraint on the auction that would be tailor-made for Frontline as the exclusive winner. In an ascending bid auction for spectrum, the bidder with the highest reservation price will typically win the license. A bidder's reservation price can roughly be thought of as the bidder's expected profits associated with deploying the spectrum for sale. Given the fact that most carriers (with the exception of Commnet) have not employed a wholesale-only model to date, it is reasonable to infer that imposing a wholesale-only requirement would decrease the expected profits of most bidders, with the exception of those like Frontline (and perhaps Frontline alone) whose specific business plan is tailored to a wholesale-only strategy. The resulting outcome would be economically inferior to an efficient allocation of the spectrum, in the sense that the winning bidder in a restricted auction would prefer to sell the spectrum to an unconstrained incumbent operator, who would be willing to pay more than the auction price. Thus, Frontline's wholesale-only restriction would reduce producer surplus relative to a world in which the most efficient entrants obtained the unrestricted E-Block.

Frontline's proposal would also decrease consumer surplus. In the absence of a wholesale-only restriction, new entrants with innovative business plans may enter to compete with incumbents, or incumbents may increase their spectrum holdings to offer new and more widely available wireless broadband services, or both. To the extent that cable companies and the "high-frequency" (PCS band) nationwide wireless carriers are not interested in a wholesale-only model, imposing such a requirement would deprive the very suppliers *who are in the best position to discipline the prices of the "low-frequency" incumbents*. Instead, Frontline's proposal would assign that task to resellers. Because Frontline's open access plan fails to specify a wholesale-pricing rule, resellers who lease from

Frontline would likely fail to discipline the prices of the “low-frequency” incumbents. Thus, Frontline’s wholesale-only restriction would reduce consumer surplus relative to a world in which the most efficient entrants obtained the unrestricted E-Block. In summary, both producer and consumer surplus would be greater without the wholesale-only restriction.

*b. Imposing a Wholesale-Only Restriction Would Likely Reduce the Incentive of Wireless Entrants to Invest in Their Own Facilities*

The danger in establishing a meaningful open-access requirement (that is, with a regulated wholesale access price) is that it likely undermines the incentives of wireless entrants to invest in their own facilities. Consider the position of the cable operators. To offer the quadruple play, they could invest billions in an auction for spectrum, and proceed to invest hundreds of millions to deploy that spectrum; or they could lease spectrum from a regulated wholesale-only provider. The Commission should be extremely cautious in imposing a wholesale-only requirement, even in a small portion of the spectrum; mandatory unbundling distorts the decisions of entrants in ways that reduce dynamic efficiency. Facilities-based competition among multiple wireless operators will ensure that little regulation will be needed.

*c. Imposing a Wholesale-Only Restriction Would Likely Reduce Auction Proceeds*

As we explained above, auction proceeds are a transfer from producers to the government, which means that they might not affect social welfare. To the extent that auctions are a more efficient way to raise revenue than taxation, however, then restrictions that reduce auction revenue would decrease social welfare. Imposing a wholesale-only requirement on the E Block would likely reduce the bidders’ expected profits, which would reduce the auction proceeds.

The competition for third-generation (3G) mobile telephone licenses in Ireland in 2001 provides a good example of what might happen to auction proceeds under a wholesale-only restriction. In 2001, the Irish regulator, Comreg, auctioned four 20-year 3G licenses.<sup>66</sup> One of the Irish 3G licenses, the “A” license, required the licensee to offer access for MVNOs—that is, the winner of the A license was constrained to a wholesale-model only. In addition to the wholesale-only requirement, the licenses differed in other (less significant) ways.<sup>67</sup>

The four licenses, one class A license and three class B licenses, were offered by means of a “beauty contest.” The applications were evaluated over several criteria, including coverage, roll-out, performance guarantees, and promotion of

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66. Media Release, *Telecoms Regulator Launches 3G Competition*, Dec. 18, 2001, available at <http://www.comreg.ie/publications/publications.5.102.100011.1.type.2001.html>.

67. For example, the B licenses required a minimum coverage of the five major cities in the country, 53 percent of the population, while the coverage requirement for the A license was 80 percent of the population. Given the relative ease in which a licensee can satisfy a build-out requirement in a small country, this difference was not likely as significant as the wholesale-only requirement.

competition.<sup>68</sup> Three companies applied for the 3G licenses; Vodafone, O<sub>2</sub>, and Hong Kong-based Hutchinson Whampoa.<sup>69</sup> All three firms applied for the A license and two firms applied for the B license. Hutchinson Whampoa was ranked number one and was awarded the A license, Vodafone and O<sub>2</sub> were awarded one B license each. The third B license was not awarded. Different access fees were specified for the two types of licenses. The price for the B licenses amounted to EUR 114.1 million,<sup>70</sup> while the price for the A license was EUR 50.7 million.<sup>71</sup> Thus, the constrained A license fetched less than half the price of the unconstrained B license. A similar result would likely materialize if the Commission embraces Frontline's wholesale-only requirement on the E Block. Given the Congressional Budget Office's estimated revenues, the costs to the Treasury could be in the billions of dollars.

*B. Skrzypacz's and Wilson's Proposal to Impose a Wholesale-Only Business Model Does Not Flow from Their Theory of Harm*

Skrzypacz and Wilson argue that an open-access requirement for the E Block license is the best way to address what they allege is a market failure—namely, the absence of wholesale-only models in the marketplace:

The question comes down to the tradeoff between potential efficiencies of vertical integration and the dominant low-frequency incumbents' incentives and ability to foreclose efficient entry in one of the interrelated markets, using the "bottleneck" at one of the other markets. Hence, we argue that right now is the best—or even only—chance of creating a market structure open to both business models and letting competitive forces, *instead of regulatory proceedings*, choose which products will be offered within each of the business models.<sup>72</sup>

We respectfully disagree. If mandatory open access is the ultimate goal, and if a regime of mandatory unbundling would be more efficient (in both a static and dynamic sense) than the status quo, then Frontline's "go slow" approach would deprive society of large welfare gains. Indeed, if Frontline's economists are wrong about incumbent carriers' quickly responding to the E Block licensee's wholesale offering with their own wholesale offerings, then society might never experience the alleged benefits of mandatory unbundling. To the extent that Frontline seeks mandatory unbundling for all wireless carriers, it should pursue that draconian agenda in some forum other than a spectrum auction.

*C. Skrzypacz and Wilson Fail to Consider the Unintended Consequences of*

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68. Media Release, *Telecoms Regulator outlines license framework for 3G mobile Telecommunications Services in Ireland*, Dec. 7, 2000, available at <http://www.comreg.ie/publications/publications.5.102.100011.1.type.2000.html>.

69. Media Release, *Three Companies Apply for 3G licences*, Mar. 27, 2002, available at <http://www.comreg.ie/publications/publications.5.102.100011.1.type.2002.html>.

70. Media Release, *ODTR Statement on 3G 'B' Licences*, Aug. 15, 2002, available at <http://www.comreg.ie/publications/publications.5.102.100011.1.type.2002.html>.

71. Media Release, *Telecoms Regulator Launches 3G Competition*, Dec. 18, 2001, available at <http://www.comreg.ie/publications/publications.5.102.100011.1.type.2001.html>.

72. Skrzypacz & Wilson at 16 (emphasis added).



*Previous Efforts to Impose Mandatory Unbundling on U.S. Wireline Operators*

The experience with government-mandated competition (either the FCC or the Justice Department) in telecommunications has a long and rather checkered history, filled with unintended consequences and competitive failures, with only intermittent successes.<sup>73</sup> As proponents of mandatory unbundling for U.S. wireless carriers, one would expect Skrzypacz and Wilson to at least discuss the experience of mandatory unbundling of U.S. wireline carriers and the fate of competitive local exchange carriers (CLECs) in the United States. For example, if they could be convinced that the identical experiment for wireline carriers was tried and then abandoned (at the urging of the courts) by the FCC, then perhaps they would not advocate repeating that same experience in the wireless industry. Yet the phrase “CLEC” cannot be found in their report. Instead, the authors skip over the most recent and relevant mandatory unbundling experience by citing an unrelated regulatory experience from the 1960s:

Such “unbundling” of product components led to many successful changes (such as the *Carterfone* decision and the equal access provisions), promoting competition and innovation, reducing costs, improving quality and extending the range of products and solutions available to customers.<sup>74</sup>

The *Carterfone* decision did not compel AT&T to divest its retail operations from its wholesale operations, as Frontline is seeking to do with the E Block licensee. Instead, *Carterfone* required AT&T to allow its customers to attach “foreign” devices to their loops as long as these devices caused no harm to the telephone network. It appears as if Frontline’s economists want to avoid any discussion of the CLEC experience.<sup>75</sup> Because the mandatory unbundling of U.S. wireline carriers is highly relevant to Frontline’s proposed wholesale-only restriction, we briefly review that experience here.

The Telecommunications Act of 1996 directed the FCC to identify network facilities of incumbent local exchange carriers (ILECs) that should be made

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73. See, e.g., Gerald R. Faulhaber, *Policy-Induced Competition: the Telecommunications Experiments*, 15 INFORMATION ECON. & POL’Y 73-97 (2003). The analysis suggests this particular form of mandate will fail as well.

74. *Id.* at 15.

75. With a second clear opportunity to describe the unbundling experiment of wireline providers, Frontline’s economists once again avoid mentioning CLECs, but instead cite to “other network industries”:

Of the possible remedies, the easiest now is to designate one license for operation of a wholesale-only network providing open access on nondiscriminatory terms. This is the lifeline that local and regional operators and new entrants need. It will yield a flowering of retail competition by enabling small or local firms to offer nationwide coverage. In economic terms, it accomplishes the essential task of unbundling—vertically disintegrating—network connectivity from retail services provided over that network. *This has been the successful cornerstone of U.S. regulatory policy in other network industries.*

*Id.* at 30 (emphasis added).

available to entrants at regulated wholesale rates.<sup>76</sup> The FCC interpreted this mandate by ruling that virtually every element of the ILECs' networks—from loops to switches to collocation cages—should be made available at forward-looking, long-run average incremental costs to competitors.<sup>77</sup> The scope of the unbundled network elements (UNEs) that the FCC deemed essential was determined to be excessive by the courts.<sup>78</sup> According to the FCC, failure to obtain virtually *any* network element, even those supplied by other parties at competitive rates, would impair a CLEC's ability to compete effectively and therefore should be supplied by the incumbents at regulated rates. Moreover, the FCC determined that, because the cost-based rates were based on the most efficient network imaginable, cost-based rates must be less than the actual historical costs of building and maintaining the ILECs' networks.

The intended beneficiaries of the unbundling regime were presumably consumers who should, in theory, pay rates that approximate the average cost of providing the service. As it turns out, the beneficiaries of the plan were some CLEC investors. Despite access to a larger capital market, U.S. CLECs failed to impose pricing discipline on incumbent wireline operators. Competition in local exchange services settled into platform competition between incumbent carriers, cable companies that offer voice telephony, and wireless providers. Most of the entrants that accepted the FCC's unbundling offer have failed.

The FCC's attempt to induce competition artificially by creating a wholesale market in network facilities with prices below actual costs resulted in an incredible waste of resources.<sup>79</sup> Given the subsidized access to their larger, incumbent rivals' facilities, the new CLECs found ready access to capital in the United States from 1996 to 2001. The capital-spending boom is now widely acknowledged to have created excess capacity in data and voice transmission,<sup>80</sup> but the rise in investment spread far beyond fiber-optic transmission facilities. Capital spending by the new local carriers increased from virtually nothing to nearly \$20 billion in 2000 alone.<sup>81</sup>

Unfortunately, these new entrants developed no new services. Most of the CLECs have exited the industry. The most successful were acquired by other local exchange carriers. As was the case in the U.S. airline and trucking industries two decades ago, for every success, a much larger number of new entrants foundered on bad business plans and a disappointing market. The failure of the CLECs was magnified because of the subsidies that lured so many new

76. 47 U.S.C. § 251(c)(3) ("An incumbent local exchange carrier shall provide such unbundled network elements in a manner that allows requesting carriers to combine such elements in order to provide such telecommunications service.").

77. Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, Third Report and Order (released Nov. 5, 1999), ¶ 285.

78. United States Telecom Association, et al. v. FCC, 290 F.3d 415 (D.C. Cir. 2002), May 24, 2002.

79. See Faulhaber, *supra* note 73, at 85-86.

80. See, e.g., *Drowning in glass: The fibre-optic glut: Can you have too much of a good thing? The history of technology says not, but that was before the fibre-optic bubble*, ECONOMIST, Mar. 24, 2001 at 1.

81. It is unclear how much of this reported capital spending was devoted to productive capacity. Much of it may have been spent on office facilities, collocation cages, marketing-related equipment, etc. For a discussion of this issue, see LARRY F. DARBY, JEFFREY A. EISENACH & JOSEPH S. KRAEMER, THE CLEC EXPERIMENT: ANATOMY OF A MELTDOWN, Progress and Freedom Foundation, Sept. 2002, at 10.

carriers into the marketplace, a feature lacking in the earlier exercises of airline and trucking deregulation.

The CLECs were discouraged from investing in their own facilities due to the FCC's unbundling rules. A CLEC will forgo facilities-based investments so long as it has other opportunities that have higher net present value. Artificially low access prices induced CLECs to defer facilities-based investments because the net present value calculations of UNE leasing were higher than those of sinking capital into on-net assets. In addition, because a CLEC can pick and choose from the incumbents' successful sunk investments, it pays for the CLEC to "wait and see" how well other investments in that sector have performed before committing itself to investing its own capital.<sup>82</sup>

The deleterious effect of mandatory unbundling on investment by both incumbents and entrants has been documented empirically.<sup>83</sup> One study by Crandall, Ingraham, and Singer found that the mis-pricing of UNE elements by the state public utility commissions (at the FCC's direction) discouraged hundreds of millions of dollars from facilities-based investment.<sup>84</sup> Using regression analysis on a cross-section of statewide data, we found that a one-percentage point increase in the price of UNEs relative to the price of building a facilities-based line caused a 1.23 percentage point increase in the ratio of facilities based to UNE lines. The authors also found that increasing UNE prices by 40 percent—an amount that would equate them with historical costs—would increase CLEC facilities-based lines by between 400,000 and 2.1 million. The Commission would be remiss not to consider this record when assessing Frontline's proposed wholesale-only requirement.

#### IV. SKRZYPACZ AND WILSON MISCHARACTERIZE THE STATE OF COMPETITION IN THE WIRELESS MARKET

Skrzypacz's and Wilson's analysis rests on assertions that the wireless incumbents have excessive market power. But Frontline's economists produce no evidence that such market power exists. Instead, they offer unsupported conjectures like the following: "Our fear, which is grounded in both economic theory and empirical analysis, is that this pattern of consolidation will lead to higher prices, poorer service, and reduced innovation."<sup>85</sup> Of course, any future consolidation among wireless carriers would trigger a review by the antitrust authorities and the FCC.

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82. For an application of real options analysis to telecommunications investment, see *THE NEW INVESTMENT OF REAL OPTIONS AND ITS IMPLICATIONS FOR TELECOMMUNICATIONS ECONOMICS* (James Alleman & Eli Noam eds. 1999); Jerry A. Hausman & J. Gregory Sidak, *A Consumer-Welfare Approach to the Mandatory Unbundling of Telecommunications Networks*, 109 *YALE L.J.* 417 (1999).

83. See, e.g., Jerry A. Hausman & J. Gregory Sidak, *Did Mandatory Unbundling Achieve Its Purpose? Empirical Evidence from Five Countries*, 1 *J. COMPETITION L. & ECON.* 173 (2005); Thomas W. Hazlett, *Rivalrous Telecommunications Networks With and Without Mandatory Sharing*, Working Paper, AEI-Brookings: Joint Center for Regulatory Studies 1 (May 2005).

84. Robert W. Crandall, Allan T. Ingraham & Hal J. Singer, *Do Unbundling Policies Discourage Facilities-Based Investment by CLECs?*, 4 *BERKELEY ELECTRONIC J. ECON. ANALYSIS & POL'Y (TOPICS)* (2004).

85. Skrzypacz & Wilson at 8.

The number of factual inaccuracies offered by Skrzypacz and Wilson in support of their alleged market failure is significant. The most egregious examples are provided below:

- Skrzypacz and Wilson claim that the “coverage advantage” enjoyed by Verizon and AT&T allow them to charge higher prices than the other national carriers.<sup>86</sup> (Verizon’s and AT&T’s prices are the same as Sprint-Nextel’s and are less than T-Mobile’s prices.)
- Skrzypacz and Wilson claim that AT&T and Verizon “add customers at a faster rate than others.”<sup>87</sup> (T-Mobile is adding customers faster than AT&T).
- Skrzypacz and Wilson claim that the industry now has only four nationwide carriers.”<sup>88</sup> (There are five nationwide carriers, including Alltel.)
- Skrzypacz and Wilson claim that wireless prices are increasing by pointing to the raising monthly cellular bills since 1998.<sup>89</sup> (Scaling the wireless monthly bills by the average number of minutes reveals a declining price.)

In this section, we review Skrzypacz’s and Wilson’s claims of market failure relating to excessive market power. Our perspective of the wireless industry is very different from that of Frontline’s economists. We perceive the industry to be characterized by intense competition along price and non-price dimensions.

*A. Wireless Prices and Entry by New Providers Are the Best Indicators of Market Power; Seller Concentration Ratios Are Just Noisy Signals.*

Skrzypacz and Wilson point to increasing seller concentration ratios to suggest that the wireless market is susceptible to an exercise of market power.<sup>90</sup> The authors seem to forget that seller concentration ratios (generally in the form of the HHI index) are taken as a simple but quite noisy signal of the possible presence of market power. The HHI index is never dispositive, but merely the starting point for further analysis involving pricing and entry. The increase in the seller concentration ratio since 2004 can be explained largely by two mergers, AT&T-Cingular<sup>91</sup> and Sprint/Nextel,<sup>92</sup> neither of which were blocked by the

86. *Id.* at 13 (“The coverage advantage that Verizon and AT&T enjoy appears to enable them to charge higher per-minute prices than their PCS-only competitors, as shown in Figure 8.”).

87. *Id.* at 3.

88. *Id.* at 6.

89. *Id.* at 9 (“As shown in Figure 3, the inflation-adjusted monthly bill initially fell, but since 1999, consumers’ monthly bills have been increasing.”).

90. Skrzypacz & Wilson at 8.

91. UNITED STATES OF AMERICA, STATE OF CONNECTICUT AND STATE OF TEXAS V. CINGULAR WIRELESS CORPORATION, SBC COMMUNICATIONS INC., BELL SOUTH CORPORATION AND AT&T WIRELESS SERVICES, INC., COMPETITIVE IMPACT STATEMENT, Civil No. 1:04CV01850, Oct. 29, 2004, 11-12, *available at* <http://www.usdoj.gov/atr/cases/f206000/206049.pdf> (“The divestiture requirements of the proposed Final Judgment will eliminate the anticompetitive effects of the acquisition in mobile wireless telecommunications services and mobile wireless broadband services in the 13 geographic markets of concern.”).

92. Department of Justice Press Release, *Statement of the Department of Justice Antitrust Division on the Closing of the Investigation of Sprint Corporation’s Acquisition of Nextel Communications Inc.*, Aug. 3, 2005, *available at* [http://www.usdoj.gov/atr/public/press\\_releases/2005/210412.pdf](http://www.usdoj.gov/atr/public/press_releases/2005/210412.pdf) (“Based on the facts, the Division found that the Sprint-Nextel merger would not give the companies market power in the areas in which they compete. Purchasers of mobile wireless services will continue to have a number of other carriers from which to choose after the merger.”).

Department of Justice or FCC because there was no finding by either agency that these mergers were anticompetitive. In an antitrust context, market power is defined as the ability to increase prices significantly above competitive rates or to exclude rivals.<sup>93</sup> When measuring market power, it is always better to rely on direct evidence—for example, data on prices or entry—than on indirect evidence such as seller concentration ratios.<sup>94</sup> The reason is that seller concentration ratios can be misleading, especially in industries where there is little correlation between seller concentration ratios and prices. As Thomas Hazlett has pointed out, the wireless industry has experienced increasing seller concentration ratios yet decreasing prices since 1999.<sup>95</sup> According to Hazlett, this relationship is consistent with the premise that “national wireless networks are acquiring licenses by auctions and mergers in order to more efficiently compete with rivals.”<sup>96</sup> Another interpretation of this apparent paradox (of lower prices and greater concentration) is that the own-price elasticity of demand for wireless service has changed significantly due to the fact that the demand for wireless services has shifted outward with new applications (such as text messaging, email, and web surfing).<sup>97</sup> As we demonstrate below, wireless carriers lack the ability to increase prices significantly above competitive rates and lack the ability to exclude rivals. Thus, they do not possess market power.

### 1. *Wireless Carriers Lack the Ability to Raise Prices*

Price data reveals that wireless carriers lack the ability to raise prices for voice services. In its series of annual *Commercial Mobile Radio Services (CMRS) Competition Reports*, the FCC has documented the concurrent increase in wireless usage and decrease in prices for wireless voice services over the past decade. Table 1 summarizes these statistics from 1993 through 2005.

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93. See, e.g., Einer Elhauge, *Defining Better Monopolization Standards*, 56 STANFORD L. REV. (2003).

94. See, e.g., J. Gregory Sidak & Jerry A. Hausman, *Evaluating Market Power Using Competitive Benchmark Prices Rather than the Hirschman-Herfindahl Index*, 74(2) ABA ANTITRUST LAW JOURNAL (2007) (“We show that prices that consumers pay for the product in question often offer a superior quantitative measurement that leads to a clearer conclusion than the HHI approach.”).

95. Thomas W. Hazlett, *Regulatory Policy at 700 MHz: Competition, Auction Receipts, and Economics Welfare*, May 23, 2007, at 9.

96. *Id.*

97. For example, under a Cournot model of competition, the price-cost margin is equal to the ratio of the HHI to the industry elasticity of demand. See, e.g., DENNIS W. CARLTON & JEFFREY M. PERLOFF, MODERN INDUSTRIAL ORGANIZATION 268 (Pearson Addison Wesley 4th ed. 2005).

TABLE 1: WIRELESS TELEPHONY PRICES AND USAGE 1993-2005

	<i>Average Monthly Wireless Bill (A)</i>	<i>Average Minutes of Use Per Month (B)</i>	<i>Average Revenue Per Minute (A / B)</i>
1993	\$61.49	140	\$0.44
1994	\$56.21	119	\$0.47
1995	\$51.00	119	\$0.43
1996	\$47.70	125	\$0.38
1997	\$42.78	117	\$0.37
1998	\$39.43	136	\$0.29
1999	\$41.24	185	\$0.22
2000	\$45.27	255	\$0.18
2001	\$47.37	380	\$0.12
2002	\$48.40	427	\$0.11
2003	\$49.91	507	\$0.10
2004	\$50.64	584	\$0.09
2005	\$49.98	740	\$0.07

Source: FCC, Eleventh Annual Report to Congress on the State of Competition in the Commercial Mobile Radio Services (CMRS) Industry, WT Dkt. No. 06-17, released Sept. 29, 2006, at tbl. 10.

Table 1 shows that the price of a wireless voice call, as measured by the revenue per minute for the operator or cost per minute from the end-user, has declined from \$0.43 in 1995 to \$0.07 in 2005—a *decline of roughly 84 percent in one decade*. There are few services consumed in the United States that have experienced such a rapid decrease in prices. Table 1 also shows that wireless usage has exploded over the same period, from 119 to 740 minutes per month. In the third figure of their report, Skrzypacz and Wilson conveniently plot the average monthly wireless bill (column A),<sup>98</sup> despite the fact that the FCC presents the data from columns A, B, and C in its annual competition report. The most generous explanation for this oversight is that Skrzypacz and Wilson were unaware that the basket of service (that is, the number of minutes used) was changing over time.

Skrzypacz and Wilson assert that AT&T and Verizon enjoy higher average revenue per minute for their wireless offerings than other wireless carriers, and that the revenue differential reveals their market power: “The coverage advantage that Verizon and AT&T enjoy appears to enable them to charge higher per-minute prices than their PCS-only competitors, as shown in Figure 8.”<sup>99</sup> As Table 2 shows, Skrzypacz and Wilson once again misinterpreted the data.

98. Skrzypacz & Wilson at 9.

99. *Id.* at 13.

TABLE 2: PRICE OF BASE SERVICE PLANS FOR FOUR MAJOR PROVIDERS

<i>Wireless Carrier</i>	<i>Cost of Plan</i>	<i>Minutes Included</i>	<i>Cost per Additional Minute</i>	<i>Cost per Minute</i>
Verizon*	\$39.99	450	\$0.45	8.9 cents
Cingular/AT&T**	\$39.99	450	\$0.45	8.9 cents
T-Mobile***	\$39.99	300	\$0.40	13.3 cents
Sprint/Nextel****	\$39.99	450	\$0.45	8.9 cents

Source: \*Verizon Wireless Website, America's Choice Basic, available at <http://www.verizonwireless.com/b2c/store/controller?item=planFirst&action=viewPlanList&sortOption=priceSort&typeId=1&subTypeId=19&catId=323>; \*\*Cingular Website, Individual Cell Phone Plans, available at <http://www.cingular.com/cell-phone-service/cell-phone-plans/individual-cell-phone-plans.jsp>; \*\*\*T-Mobile Website, myFaves 300, available at <http://www.t-mobile.com/shop/plans/detail.aspx?tp=tb1&id=6af9b2f3-8491-433e-9e0e-7e30cc471ec8>; \*\*\*\*Sprint Website, Plans for Sprint PCS Phones, available at [http://www1.sprintpcs.com/explore/servicePlansOptionsV2/FreeClearFairFlexiblePlans.jsp?FOLDER%3C%3Efolder\\_id=1661521&CURRENT\\_USER%3C%3EATR\\_SCID=ECOMM&CURRENT\\_USER%3C%3EATR\\_PC ode=None&CURRENT\\_USER%3C%3EATR\\_cartState=group](http://www1.sprintpcs.com/explore/servicePlansOptionsV2/FreeClearFairFlexiblePlans.jsp?FOLDER%3C%3Efolder_id=1661521&CURRENT_USER%3C%3EATR_SCID=ECOMM&CURRENT_USER%3C%3EATR_PC ode=None&CURRENT_USER%3C%3EATR_cartState=group).

According to their websites, AT&T, Verizon and Sprint/Nextel charge *identical* prices per minute, both for minutes included and for additional minutes. To an economist, such pricing appears to obey the “law of one price,” which dictates that in an efficient market identical (or nearly identical) goods must have only one price. T-Mobile’s prices are higher than those of AT&T and Verizon, but they include unlimited calls to five numbers regardless of which carrier the called-party uses. Thus, it is incorrect to assert that AT&T and Verizon charge higher prices than other wireless carriers. To the extent that Verizon’s and AT&T’s average revenues per minute for voice calls are higher than other carriers’, this difference is likely attributed to differences in product offering (for example, unlimited calling plans) and differences in customer base (prepaid versus subscription) across carriers.

## 2. Wireless Carriers Lack the Ability to Exclude Rivals

Market data reveals that wireless carriers lack the ability to exclude rivals. The FCC’s *Eleventh Annual CMRS Report* reports that, as of 2006, roughly 94 percent of the U.S. population had a choice of at least four wireless operators.<sup>100</sup> That represents an increase from the roughly 80 percent of the population that had a choice of four or more operators in 2000.<sup>101</sup> The fact that 14 percent of the population (equal to 94 percent less 80 percent) experienced one extra choice in just the past five years implies that the supply of wireless service is increasing and that there are few barriers to entry. These data appear to undermine the assertion by Frontline’s economists that “there are only two providers in a given area that are true head-to-head competitors for services such as roaming.”<sup>102</sup>

Entry into the wireless service market can occur through expansion of regional wireless networks, through new entry, or both. Both kinds of entry occurred in the FCC’s recent Advanced Wireless Services spectrum auction, which closed in September 2006 after raising roughly \$13.7 billion for the U.S.

100. *Eleventh Annual Report*, *supra* note 16, at tbl. 11.

101. *Id.*

102. Skrzypacz & Wilson at 9.

Treasury.<sup>103</sup> Regional operators like MetroPCS (the fourth biggest winner) and Cricket (the sixth biggest winner) expanded their existing wireless footprints and acquired sufficient spectrum to offer broadband services.<sup>104</sup> Cable operators Comcast, Cox, and Time Warner also acquired spectrum in the auction.<sup>105</sup> According to FCC Chairman Kevin Martin, “more than half of the winning bidders were small business.”<sup>106</sup> And the entry process is nowhere near complete.

### *B. Wireless Provides Also Compete Along Non-Price Dimensions*

Frontline’s economists argue that regulatory intervention of the kind they seek would increase the quality of service and the number of handsets that are available to wireless customers.

#### *1. Quality of Service*

Skrzypacz and Wilson argue that a wholesale-only requirement for the E Block licensee would “encourage a wider array of service offerings of higher quality.”<sup>107</sup> In addition to falling prices and higher usage, the quality of wireless service appears to have improved significantly. According to a J.D. Power and Associates survey released in March 2007, the overall rate of customers experiencing a wireless call quality problem declined for a third consecutive year.<sup>108</sup> One explanation for the higher satisfaction is the competitive build out of digital wireless networks. Digital technology provides better sound quality than analog technology. According to the FCC, digital technology is now dominant in the mobile telephone sector, with approximately 97 percent of all wireless subscribers using digital service.<sup>109</sup> Digital technology also allows for more efficient use of the spectrum. By improving network performance, these upgrades improved the quality of service through (1) better voice quality, (2) higher call-completion rates, (3) fewer dropped calls and deadzones, (4) additional calling features, (5) more rapid data transmission, and (6) advanced data applications.<sup>110</sup> Given the extremely high quality of service that wireless customers currently enjoy, it is hard to conceive how regulatory intervention could improve on the status quo.

103. FCC, Auction 66 Advanced Wireless Services (AWS-1), All Bidders Spreadsheet, available at <http://wireless.fcc.gov/auctions/66/charts/66bidder.xls>.

104. *Id.*

105. *Cable Consortium Acquires Spectrum Licenses Covering National Foot*, PR NEWswire, Oct. 5, 2006, available at <http://sev.prnewswire.com/entertainment/20061005/PTH01505102006-1.html>.

106. *FCC Spectrum Auction Closes, T-Mobile Among Top Winners*, XCHANGEMAG, Sept. 19, 2006, available at <http://www.xchangemag.com/hotnews/69h198599.html>.

107. Skrzypacz & Wilson at 5.

108. J.D. Power and Associates Reports: Wireless Call Quality Problems Continue to Decline as the Transition to 3G Networks Takes Hold, Mar. 15, 2007, available at <http://www.newscom.com/cgi-bin/prnh/20050527/LAF028LOGO-a>.

109. *Eleventh Annual Report*, *supra* note 16, ¶105.

110. *Id.* ¶131.



## 2. Handsets

Skrzypacz and Wilson argue that Frontline’s proposal would “extend the range of products and solutions available to customers.”<sup>111</sup> A review of the operators’ websites reveals that competition for handsets is intense. Table 3 shows the wide diversity of handsets available from the five nationwide wireless operators.

TABLE 3: NUMBER OF UNIQUE BRANDS AND MODELS SOLD BY THE TOP FIVE U.S. WIRELESS OPERATORS

Wireless Carrier	Number of Brands*	Number of Handsets
Verizon	7	36
Cingular/AT&T	9	45
Alltel	9	23
T-Mobile	4	27
Sprint/Nextel	6	41
<b>Total</b>	<b>12</b>	<b>154**</b>

Source: Verizon Wireless, [www.verizonwireless.com](http://www.verizonwireless.com) (last visited Mar. 13, 2007), T-Mobile, [www.t-mobile.com](http://www.t-mobile.com) (last visited Mar. 13, 2007), Alltel Wireless, [www.alltel.com](http://www.alltel.com) (last visited Mar. 13, 2007), AT&T Wireless, [www.cingular.com](http://www.cingular.com) (last visited Mar. 13, 2007), Sprint, [www.sprint.com](http://www.sprint.com) (last visited Mar. 13, 2007).

Note: \* The brands represented include Blackberry, Firefly, Kyocera, LG, Motorola, Nokia, Palm, Pantech, Samsung, Sanyo, Sony Ericsson, and UTStarcom. \*\* The total figure eliminates any redundant phones (for example, the Palm 700p is offered by Alltel, Sprint, and Verizon, but is only represented once in the total). Several carriers, including Verizon, Sprint, AT&T, and T-Mobile, have devices with no easily ascertained brand (for example, the T-Mobile Sidekick). These fifteen handsets are captured in the total number of handsets. Therefore, the total figure comprises all unique handsets available.

Given the breadth of device choices facing wireless consumers, it is not clear that a wholesale-only requirement for the E Block licensee would increase the number of handset choices relative to the status quo. Moreover, the wholesale-only requirement is likely to impede the introduction of new “next generation” technologies. Incumbent carriers with integrated wholesale-retail operations have the ability to “pre-seed” the market with dual-mode handsets that support both legacy and new technologies that are in the process of being deployed. This type of cross-subsidy gets around the “chicken and egg” problem—namely, customers will not pay more for features they cannot use today and networks will not get built unless there are customers who will use them. By splitting the wholesale and retail functions, it is not immediately clear how the E Block licensee could introduce innovative follow-on technologies.

## V. CONCLUSION

We conclude that all potential bidders, including incumbent wireless operators and cable providers, should be allowed to compete in the auction on an equal footing. We also conclude that requiring a particular business model of the licensee is likely to reduce social welfare. Frontline’s economists are essentially arguing that de novo entry by an unproven competitor with a speculative business plan that depends on its ability to negotiate prices and terms with the public safety community is more likely to increase competition than allowing the “high-

111. Skrzypacz & Wilson at 15.

frequency” wireless carriers and cable providers to bid for the spectrum. The FCC should send a clear signal to industry participants that it reaffirms its commitment to market-based solutions in spectrum management and firmly rejects any form of rent-seeking behavior by rejecting Frontline’s proposal.